From the INTERNATIONAL SEARCHING AUTHORITY To: NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND REITSTÖTTER, KINZEBACH & PARTNER (GBR) THE WRITTEN OPINIONAL THE WRITTEN OPINIONAL SEARCHINE AUTHORITKING DEPLACATION Sternwartstrasse 4 D-81679 München GERMANY 09. Sep. 2005 Eing. Sternwartstp-CT Rule84479) München Date of mailing (day/month/year) 08/09/2005 ~ Applicant's or agent's flie reference FOR FURTHER ACTION See paragraphs 1 and 4 below M/45271-PCT International application No. International filing date (day/month/year) PCT/EP2004/010930 30/09/2004 Applicant NUVERA FUEL CELLS EUROPE S.R.L. The applicant is hereby notified that the international search report and the written opinion of the International Searching 1. 🔯 Authority have been established and are transmitted herewith. Filing of amendments and statement under Article 19: The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46): The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet. International Bureau of WIPO, 34 chemin des Colombettes Where? Directly to the 1211 Geneva 20, Switzerland, Fascimile No.: (41-22) 740.14.35 For more detailed instructions, see the notes on the accompanying sheet. The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith. With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that: the protest together with the decision thereon has been transmitted to the international Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices. no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made. Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication. The applicant may submit comments on an informal basis on the written oplnion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the PCT Applicant's Guide, Volume II, National Chapters and the WIPO Internet site.

WithIn 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed

Name and mailing address of the International Searching Authority

European Patent Office, P.B. 5818 Patentlaan 2

the public but not before the expiration of 30 months from the priority date.

acts for entry into the national phase before those designated Offices.

NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016

Authorized officer

Véronique Baillou

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international polication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

Notes to Form PCT/ISA/220 (first sheet) (January 1994)

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

- [Where originally there were 48 claims and after amendment of some claims there are 51]:
 "Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers;
 claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
- (Where originally there were 15 claims and after amendment of all claims there are 11): "Claims 1 to 15 replaced by amended claims 1 to 11."
- [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
 "Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or "Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
- 4. [Where various kinds of amendments are made]: "Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international appplication is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

Notes to Form PCT/ISA/220 (second sheet) (January 1994)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER	see Form PCT/ISA/220			
M/45271-PCT	ACTION as	well as, where applicable, item 5 below.			
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)			
PCT/EP2004/010930 30/09/2004 01/10/200		01/10/2003			
Applicant	30,00,2001				
NUVERA FUEL CELLS EUROPE S	S.R.L.				
This International Search Report has been according to Article 18. A copy is being tra	n prepared by this International Searching ansmitted to the International Bureau.	Authority and is transmitted to the applicant			
This International Search Report consists	of a total of sheets.				
X It is also accompanied by	a copy of each prior art document cited in	this report.			
language in which it was filed, un	less otherwise indicated under this item. search was carried out on the basis of a tr	basis of the international application in the ansiation of the international application furnished to			
this Authority (Ru	` ''	sed In the international application, see Box No. I.			
2. Certain claims were fou	nd unsearchable (See Box II).				
3. Unity of invention is lac	king (see Box III).				
4. With regard to the title,					
. —	ubmitted by the applicant.				
the text has been establis	shed by this Authority to read as follows:				
5. With regard to the abstract,					
	ubmitted by the applicant.				
the text has been established	shed, according to Rule 38.2(b), by this Au	thority as it appears in Box No. IV. The applicant			
may, within one month fr	om me date of mailing of this international	search report, submit comments to this Authority.			
6. With regard to the drawings,					
a. the figure of the drawings to be	published with the abstract is Figure No. $_$	3			
as suggested by	• •				
	his Authority, because the applicant failed to				
	his Authority, because this figure better cha	racterizes the invention.			
b. none of the figures is to t	be published with the abstract.				

International Application No PCT/EP2004/010930

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01M8/02 H01M8/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 HO1M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

Category °	Citation of document, with Indication, where appropriate, of the relevant passages	Relevant to daim No.
Х	WO 02/23645 A (H POWER ENTERPRISES OF CANADA INC; CONDEESCU, ADRIAN; ROBERGE, RAYMOND) 21 March 2002 (2002-03-21)	1-4, 12-14
Y	page 4, line 34 - page 7, line 36; figures 7-9	10,11
Υ	US 5 578 388 A (FAITA ET AL) 26 November 1996 (1996-11-26) cited in the application column 10, lines 1-5; figure 5 column 4, line 66 - column 5, line 10	10,11
	-/	

Y Further documents are listed in the continuation of box C.	Patent family members are listed in annex.
Special categories of cited documents: A' document defining the general state of the art which is not considered to be of particular relevance E' earlier document but published on or after the international filing date L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) O' document referring to an oral disclosure, use, exhibition or other means P' document published prior to the international filing date but later than the priority date claimed	 'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention 'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone 'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. '&' document member of the same patent family
Date of the actual completion of the international search	Date of mailing of the international search report
31 August 2005	08/09/2005
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk	Authorized officer
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Fitzpatrick, J

1

International Application No
PCT/EP2004/010930

ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Chatian of degree and with indication, where consensate of the selevant passages	Relevant to claim No.
Citation of document, with indication, where appropriate, of the relevant passages	Helevani lo cialm No.
WO 00/70698 A (DE NORA FUEL CELLS S.P.A; MAZZUCCHELLI, GABRIELE; BRAMBILLA, MASSIMO;) 23 November 2000 (2000-11-23) figures 1,5 page 13, lines 16-19 page 14, lines 5-15 examples 1-3	10,11
US 4 279 731 A (PELLEGRI ET AL) 21 July 1981 (1981-07-21) column 6, line 59 - column 7, line 19	1-4,9,10
US 3 589 942 A (FRANK B. LEITZ JR ET AL) 29 June 1971 (1971-06-29) column 3, lines 12-43; figure 2	1-4, 12-14
	MAZZUCCHELLI, GABRIELE; BRAMBILLA, MASSIMO;) 23 November 2000 (2000-11-23) figures 1,5 page 13, lines 16-19 page 14, lines 5-15 examples 1-3 US 4 279 731 A (PELLEGRI ET AL) 21 July 1981 (1981-07-21) column 6, line 59 - column 7, line 19 US 3 589 942 A (FRANK B. LEITZ JR ET AL) 29 June 1971 (1971-06-29)

1

Information on patent family members

International Application No
PCT/EP2004/010930

Patent document	Т	Publication		Patent family	Publication
cited in search report		date		member(s)	date
WO 0223645	Α	21-03-2002	AU WO	9353601 A 0223645 A2	26-03-2002 21-03-2002
US 5578388	Α	26-11-1996	IT	1270878 B	13-05-1997
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Information on patent family members

International Application No
PCT/EP2004/010930

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		JP	63015354 B	04-04-1988
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US 3589942 A	29-06-1971	NONE		

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY Reit			Palentanwälte ötter, Kinzebach & Part.
To:	orm PCT/ISA/220	Eing	() 9. Sep. 2005 PCT artstr. 4 D-81679 München WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43 bis. 1) Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet)
Applicant's or agent's file reference see form PCT/ISA/220			FOR FURTHER ACTION See paragraph 2 below
International application PCT/EP2004/01		ternational filing date <i>(d.</i> 0.09.2004	Asylmonth/year) Priority date (daylmonth/year) 01.10.2003
H01M8/02, H01 Applicant	Classification (IPC) or both M8/04 CELLS EUROPE S.F		and IPC
Box No. FURTHER If a demand written opin the applicar International	II Priority III Non-establishment IV Lack of unity of inv V Reasoned stateme applicability; citation VI Certain documents VII Certain defects in the vision observation ACTION If or international prelimination of the International Part chooses an Authority of the vision of the Internation of the In	t of opinion with regar vention ent under Rule 43 <i>bis</i> , ons and explanations is cited the international appl ons on the internation mary examination is mary examining other than this one to	ard to novelty, inventive step and industrial applicability 1(a)(i) with regard to novelty, inventive step or industrial supporting such statement
submit to th months fror whichever e	e IPEA a written reply to	gether, where approp form PCT/ISA/220 or I	written opinion of the IPEA, the applicant is invited to priate, with amendments, before the expiration of three before the expiration of 22 months from the priority date,
3. For further	details, see notes to Forr	π PCT/ISA/220.	

Name and mailing address of the ISA:

Authorized Officer

<u>)</u>))

European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465

Fitzpatrick, J

Telephone No. +49 89 2399-8570



WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

10/572534 IAP9 Rec'dPCT/PTO 17 MAR 2006 International application No. PCT/EP2004/010930

	Во	x N	o. I	Basis of the opinion
1.	Wit the	h re Ian	egard guag	to the language , this opinion has been established on the basis of the international application in e in which it was filed, unless otherwise indicated under this item.
		lar	ngua	sinion has been established on the basis of a translation from the original language into the following ge , which is the language of a translation furnished for the purposes of international search Rules 12.3 and 23.1(b)).
2.	Wit nec	h re ess	gard ary t	to any nucleotide and/or amino acid sequence disclosed in the international application and o the claimed invention, this opinion has been established on the basis of:
	a. t	ype	of m	aterial:
	l		a se	equence listing
	(table	e(s) related to the sequence listing
	b. fe	orm	at of	material:
	(in w	ritten format
	ſ		in c	omputer readable form
	c. ti	me	of fil	ing/furnishing:
	(con	tained in the international application as filed.
	Į		filed	together with the international application in computer readable form.
	į		furn	ished subsequently to this Authority for the purposes of search.
3.		ha co	s bed pies	cion, in the case that more than one version or copy of a sequence listing and/or table relating thereto en filed or furnished, the required statements that the information in the subsequent or additional is identical to that in the application as filed or does not go beyond the application as filed, as riate, were furnished.
1.	Adc	ditio	nal c	omments:
_	Box	c No	o. II	Priority
۱.		do red	es no quire	lidity of the priority claim has not been considered because the International Searching Authority of have in its possession a copy of the earlier application whose priority has been claimed or, where d, a translation of that earlier application. This opinion has nevertheless been established on the option that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2.		ha	s be	inion has been established as if no priority had been claimed due to the fact that the priority claim en found invalid (Rules 43 <i>bis</i> .1 and 64.1). Thus for the purposes of this opinion, the international ate indicated above is considered to be the relevant date.
3.	Add	litio	nal o	bservations, if necessary:

see separate sheet

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims

5-11

No: Claims

1-4,12-14

Inventive step (IS)

Yes: Claims

No: Claims

5-11

1-14

Industrial applicability (IA)

Yes: Claims

No:

Claims

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Section II.3: Priority - Additional Observations

From the original Italian priority document MI20031881 and on the basis of the current set of claims, the priority appears to be validly claimed.

Section V.2: Citations and Observations

- (i) Document WO02/23645 (D1) discloses a liquid cooled bipolar separator plate assembly for use in the construction of a fuel cell and whereby the structure is positioned between MEA assemblies The bipolar separator plate comprises a pair of rectangular distributor plates (11, 11') having perforations 20 and disposed in spaced parallel relationship by an intermediate structure. This structure may be comprised of two corrugated plates 12 of undulated cross-section with each plate defining longitudinal peaks and valleys. The separator plates are also rectangular plates and are interconnected in back-to-back relationship at the peaks to form a group of inner adjacent cooling liquid channels 15 therebetween and a first and second group of outer gas channels 16 and 17 on opposed outer sides of the interconnected separator plates. The peaks on the outer sides are secured to a respective one of the perforated distributor plates by welding. The inner cooling liquid channels and the outer gas channels are opened at opposed end edges of the interconnected separator and distributor plates. From the detail given in the figures, the perforations 20 are clearly constant in size and ordered. The are thus fairly considered as calibrated. Bearing also in mind that the use(s) to which the product components of the structure are put are only limiting to the extent that said components should be suitable for said use(s), the complete disclosure of document D1 is prejudicial to the novelty of at least the subject matters of current claims 1-4 and 12-14.
- (ii) The Applicant has himself conceded in the description on page 3 and page 7 in combination with Fig.1 that the use of reticulated current collectors between the bipolar separator and MEA to both improve electrical continuity and reactant gas distribution is known in the art. This is apparent, for example, from the specific disclosures of document US5578388 (D2) or the later document WO00/70698 (D3) referred to in the International Search Report (ISR). As such, the subject matters of current claims 10 and 11 could not provide the required inventive step in a new main claim.
- (iii) Although the features of current claims 5,6 and 9 are not disclosed in the documents of

the (ISR), it is not currently apparent what contribution they could make to a new main claim which would be sufficient to also satisfy the inventive step requirements of Art.33(3) PCT.

Section VIII: Certain Observations

The application infringes the requirements of Art.6 PCT in the following respects:

- (i) The two embodiments of the invention described on pages 5 and the additional embodiment on page 7 referring to "or otherwise secured" do not fall within the scope of the claims, which requires the cathode and anode sheets to be "welded or metallurgically bonded" through the corrugated conductive element. This inconsistency between the claims and the description leads to doubt concerning the matter for which protection is sought, thereby rendering the claims unclear, Article 6 PCT.
- (ii) The description moreover does not indicate any other methods of securing said sheets in a manner suitable for a fuel cell stack. In this regard, the simple act of applying pressure to secure said sheets would be still covered by these disclosures in the description. Such can clearly however not be intended as the invention addresses inter alia the problem of facilitating easier assembly by providing the integral bipolar separator as claimed. The features of being "welded or metallurgically bonded" are thus features essential to the invention within the contexts of Art.6 PCT and Art.33(3) PCT (inventive step). The above discrepancies must thus be resolved via excision of the offending terms form the description.
- (iii) Claim 14 does not meet the requirements of Article 6 PCT in that in merely referring to the drawings, the matter for which protection is sought is not clearly defined.

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